

A schematic comparison between Albanian Ophiolites with Idealized Ophiolite Sequence, Penrose Conference

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According to Penrose Conference participants (1972) an idealized ophiolite sequence includes from the bottom upward, tectonized ultramafic mantle rocks, layered ultramafic to mafic cumulate rocks, isotropic gabbros, a sheeted dyke complex and a massive volcanic section dominated by pillow lavas and overlain by pelagic sediments.

Albanian ophiolites extending over 4 000 km² or 1/7th of Albanian territory link together the Dinaric and Hellenic ophiolites. They form two NNW-SSE sub-parallel belts, *the western ophiolite belt* and the *eastern ophiolite belt*, representing the most complete and coherent sequence of the Mediterranean ophiolites (Beccaluva et al., 1994; Shallo et al., 1995).

The Western belt ophiolite - It consist of high-Ti tholeiites within volcano-sedimentary series in the western peripheral parts and a volcanic sequence in the western part associated with lherzolite mantle suite and minor harzburgite and dunite tectonite and ultramafic and mafic cumulates (Shallo et al.1985; Beccaluva et al., 1994).

Westermost part ophiolites of the Rubiku-Vela area -

The volcano-sedimentary series comprises high-Ti tholeiitic pillow lavas of MORB affinity (Shallo et al.1985; Beccaluva et al. 1994) with scarce intercalations of argillitic-silicious-sericitic of sericitic-siliceous-carbonate shales and slates, and infrequently, hematitic radiolarian chert. The series is about 600 thick and northwest trending. The radiolarian assemblages of the chert specimens, intercalated with massive sulfide ores, indicate a Middle-Late Carnian age, possibly including the Early Norian (Hoxha, 2001).

At Rubiku and its vicinities, agglomerate and argillitic-siliceous shales topped by yellow-reddish hematitic manganiferous radiolarian chert overlie basaltic pillow lavas. Volcano-sedimentary series are underlain by gabbro, troctolite, ferro-gabbro, very scarce minor microdiorite as well as ultramafic injections and "wedges", ranging in thickness from few meters up to 100 m. It must be emphasized that ultramafics in many cases are changed to serpentines.

The greenschist-amphibolite sole Bajocian-Bathonian in age is widespread in the western ophiolite belt; it is located along the volcano-sedimentary-ultramafic contact with thickness from a few meters up to 120 m, with 2 to 4 m amphibolites and 10-120 m greenschists.

Western part ophiolite of Gziky-Kachinar area - The lithologica-startigraphical section consists of volcanic sequence overlain by Middle Jurassic hematitic shales and is underlain by gabbro, very scarce plagiogranite and ultramafic rocks. The volcanic sequence consists of an Upper basaltic pyroclastic succession averaging 400 m and a Lower basaltic pillows (mainly) and massive succession, about 600 m thick. The enormous resources of vanadium-bearing titaniferous gabbros of the Kachinar area located in their uppermost part, at the base of volcanics, should be noted.

The Eastern belt ophiolites - This belt is characterized by low-Ti tholeiites of basalt-andesite and andesite-dacite (rhyolite) series underlain by sheeted dyke complex, and quartzdiorite-plagiogranite and gabbros (ISPGJ-IGJN, 1983; Beccaluva et al.1994; Shallo, 1994) extending from Kyafe Mali in the north to Perlati in the south, offering the best prospects regarding copper-pyrite-zinc and precious metals mineralizations.

Due to some differences between the northern and the southern parts they will be described separately.

Northern Kyafe Mali-Spach area - It comprises two volcanic successions the lower and the upper one.

The Middle-Late Jurassic lower andesite-basalt pillow lava succession - It consists mainly of pillows (spilite) and occasional massive flows, about 1 000 m thick. They have glassy rim and quenched glass filling interstitial cavities.

Dykes, extending over than 30 km, from Repsi to Kyafe Mali, several centimeters to 2-3 m thick, consist of dolerite, microdiorite, andesite, dacite or rhyodacite and rare boninite dykes (Beccaluva et al., 1994; Shallo, 1994).

The Late Jurassic upper andesitic basalt and dacite pyroclastic succession, about 700 m thick, consists mainly of pyroclastic rocks and occasionally pillows. This succession is followed by a 1 meter to 10 m thick manganese-bearing hematitic radiolarian chert sequence of Late Callovian to Early Oxfordian age (Marcucci et al., 1994).

Southern Perlat-Kurbnesch area

The rocks of this area are internally disrupted, due to intense thrust tectonics. Tectonostratigraphy of the area consist of the Middle-Late Jurassic Lower andesite basalt pillow lava and rare massive flow succession, about 500 m thick and Late Jurassic Upper andesite basalt pyroclastic succession, about 300 m thick overlain by argillaceous-siliceous succession with radiolarian chert.

The volcanics are underlain by sheeted dyke complex, and quartzdiorite-plagiogranite and gabbros.

The Penrose Conference definition remains from the greatest achivments in geosciences.

From the comparison of Albanian ophiolite sections with the Penrose Conference definition only the sheeted dyke dominated segment (Chafe Mali-Reps), widely accepted formed above a subducting plate margin, is similar with it, the other parts seems to represent various stages of oceanic crust formation.

References

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